# Nebraska Severe Weather Awareness Week
## March 19th - 23rd, 2012

As we all know by now, 2011 was a record breaking year, and for many a heart breaking year, for tornadoes across the United States. Nearly 1,700 tornadoes tore through fields, towns, cities and neighborhoods. The 552 confirmed fatalities was more than the previous ten years combined (564 fatalities 2001-2010) and second most in U.S. history, trailing only 1925. Outbreaks in North Carolina, Alabama and the rest of the Deep South, were punctuated by a massive EF5 tornado which severed Joplin, MO, killing 162 and injuring more than 1,000 more. Right here in Nebraska, nearly 20 tornadoes on June 20th alone. The numbers are staggering in some cases. However, sometimes in trial and tribulation, there can be opportunity.

Now is the time to prepare for severe weather. Not as the event occurs, or after the event, but before. Now is the time to become "*Weather-Ready*". Severe Weather Awareness Week gives us that opportunity, and here's how:

- The National Weather Service has set forth an initiative to become a "*Weather-Ready Nation*". Becoming "*Weather-Ready*" affects us all; at home, work and play. Becoming "*Weather-Ready*" isn't just about tornadoes, it's about "all-hazards" associated with spring severe weather. In 2011, 104 people died in flood related events. Another 26 died after being struck by lightning. Could these deaths have been prevented?
- We have the opportunity to participate in the **Tornado Safety Drill on Wednesday, March 21st**. This statewide drill is for all of us to test our plans if a tornado warning was issued for our area. This test gives you a real-life, real-time opportunity to test your "weather-readiness".
- As part of becoming a "Weather-Ready Nation", the NWS has expanded its preparedness and forecasting role to Local, State and Federal Emergency Management partners to include "Decision Support Services", or DSS for short. Last year, meteorologists and hydrologists from 4 Nebraska NWS offices provided such support for the Nebraska Emergency Management and the U.S. Army Corp of Engineers (and other supporting agencies) during the record-breaking flood on both the Platte and Missouri Rivers. Look for more of these type of services in the years to come.

In closing, you may think participating in Severe Weather Awareness Week doesn't do any good. Instead, think about how *many more people* would have died last year had we not been steadfast in our promotion of Severe Weather Awareness in Nebraska and across the U.S. Would we have escaped June 20th without any deaths or serious injuries? In fact, you (the media, Emergency Managers, etc.) are a most critical link in protecting the public. **Thank you for your help in this endeavor.** Thank you for using the information in this packet and making Severe Weather Awareness Week another success in 2012 .


**Tornado Safety Drill**

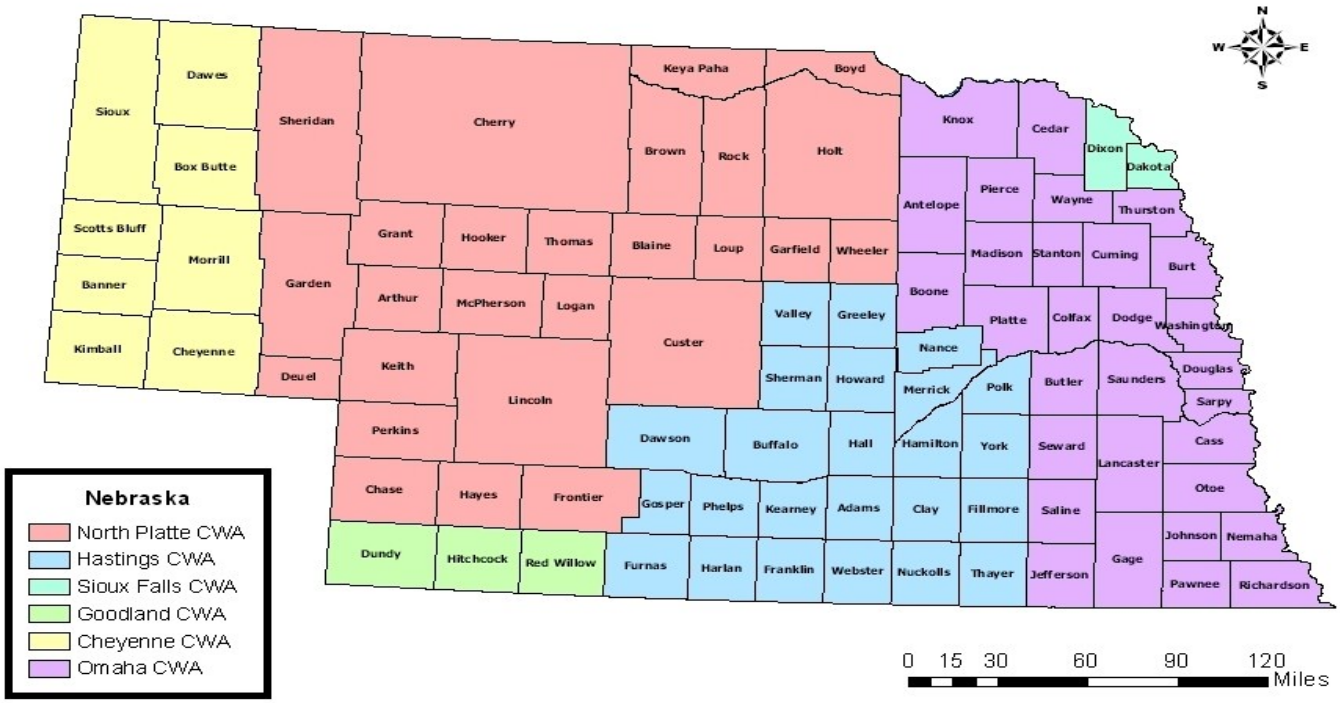
**Between**
**10 a.m. & 11 a.m. CDT**
**9 a.m. & 10 a.m. MDT**

### WHAT'S INSIDE?

# National Weather Service Offices Serving Nebraska

*Severe Weather Awareness Week - March 19th - 23rd*

## National Weather Service Coverage Area




| Far West | West and North Central | Southwest |
|---|---|---|
| National Weather Service<br>1301 Airport Parkway<br>Cheyenne, Wyoming 82001<br>(307) 772-2468<br><br>**http://www.weather.gov/cys** | National Weather Service<br>5250 E. Lee Bird Drive<br>North Platte, Nebraska 69101<br>(308) 532-4936<br><br>**http://www.weather.gov/lbf** | National Weather Service<br>920 Armory Road<br>Goodland, Kansas 67735<br>(785) 899-7119<br><br>**http://www.weather.gov/gld** |

| South Central | East | Far Northeast |
|---|---|---|
| National Weather Service<br>6365 North Osborne Drive West<br>Hastings, Nebraska 68901<br>(402) 462-4287<br><br>**http://www.weather.gov/gid** | National Weather Service<br>6707 North 288th Street<br>Valley, Nebraska 68064<br>(402) 359-5166<br><br>**http://www.weather.gov/oax** | National Weather Service<br>26 Weather Lane<br>Sioux Falls, South Dakota 57104<br>(605) 330-4247<br><br>**http://www.weather.gov/fsd** |

# 2011 Nebraska Tornado Facts

*Severe Weather Awareness Week - March 19th - 23rd*

**Tornadoes**: 55 (13 above the 1950-2010 average of 42 & 3 above the 30 year average of 52)

**Deaths**: 0 **Injuries**: 1 (June 20th in Buffalo County near Elm Creek)

**Longest Track**: 15.26 miles (June 20th - York County - 4 SW of Bradshaw to 4 SE of Polk)

**Greatest Width**: 1320 yards or 3/4 of a mile (June 20th - Buffalo County near Amherst)

**Strongest**: EF3 (3 - June 20th - Buffalo County near Amherst, Polk County west of Osceola, & August 11th - Cherry County southeast of Wood Lake)

**Most in a county**: 5 (Cherry County)

**Days of occurrence (Days with 1 or more tornadoes)**: 19

**Most in one day**: 14 (June 20th)

**Most active hour of the day**: 12 tornadoes from 8-9 p.m. CDT / 7-8 p.m. MDT

**Most in one month**: 25 (June)

**First tornado of the year**: March 22nd (EF1 - Burt County near Craig)

**Last tornado of the year**: August 29th (EF0 - Dawes County near Chadron)

Tornado 5 miles southwest of Johnstown, NE on August 11th. (Courtesy of Lendi Goochey)

## 2011 Monthly Tornado Totals

| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total | 0 | 0 | 1 | 0 | 13 | 25 | 3 | 13 | 0 | 0 | 0 | 0 | 55 | 100% |
| EF5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0% |
| EF4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0% |
| EF3 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 3 | 6% |
| EF2 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 7% |
| EF1 | 0 | 0 | 1 | 0 | 2 | 5 | 0 | 1 | 0 | 0 | 0 | 0 | 9 | 16% |
| EF0 | 0 | 0 | 0 | 0 | 11 | 14 | 3 | 11 | 0 | 0 | 0 | 0 | 39 | 71% |

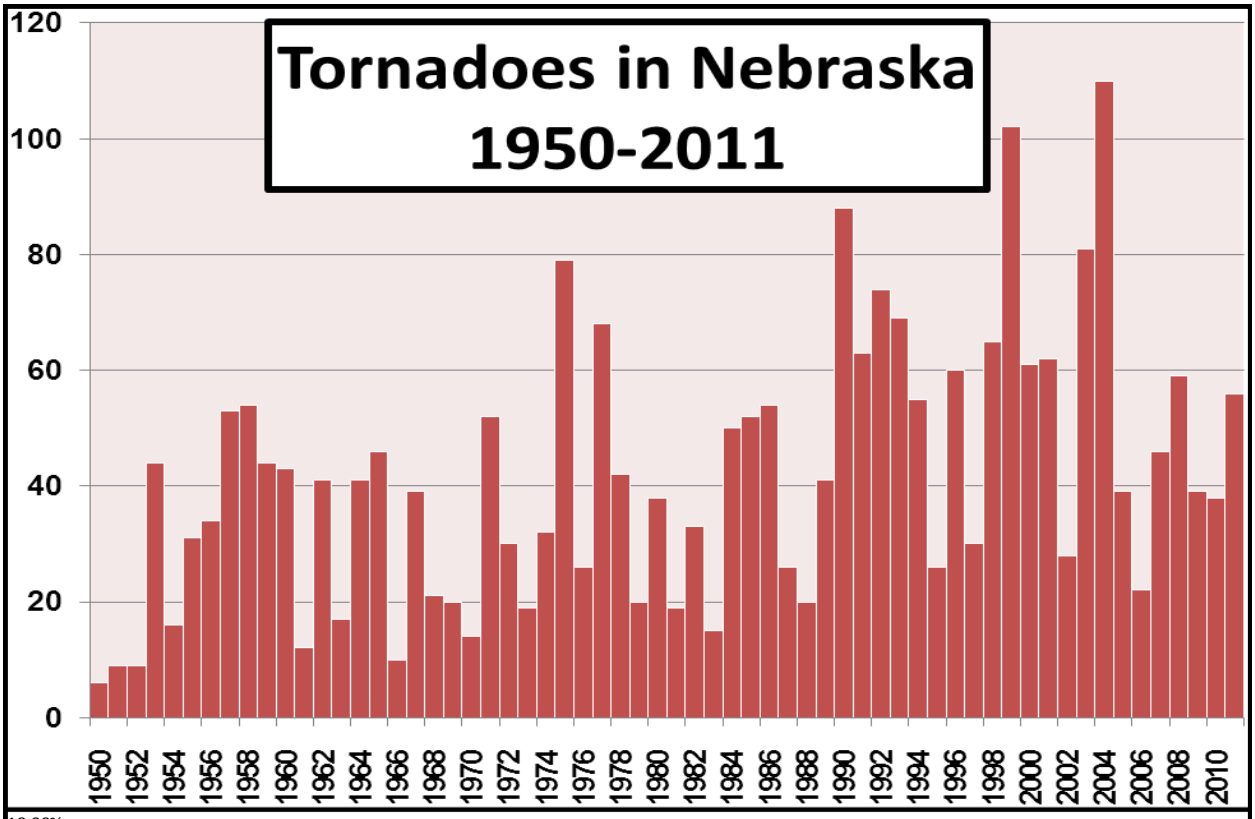
## *2011 Season Peak…*

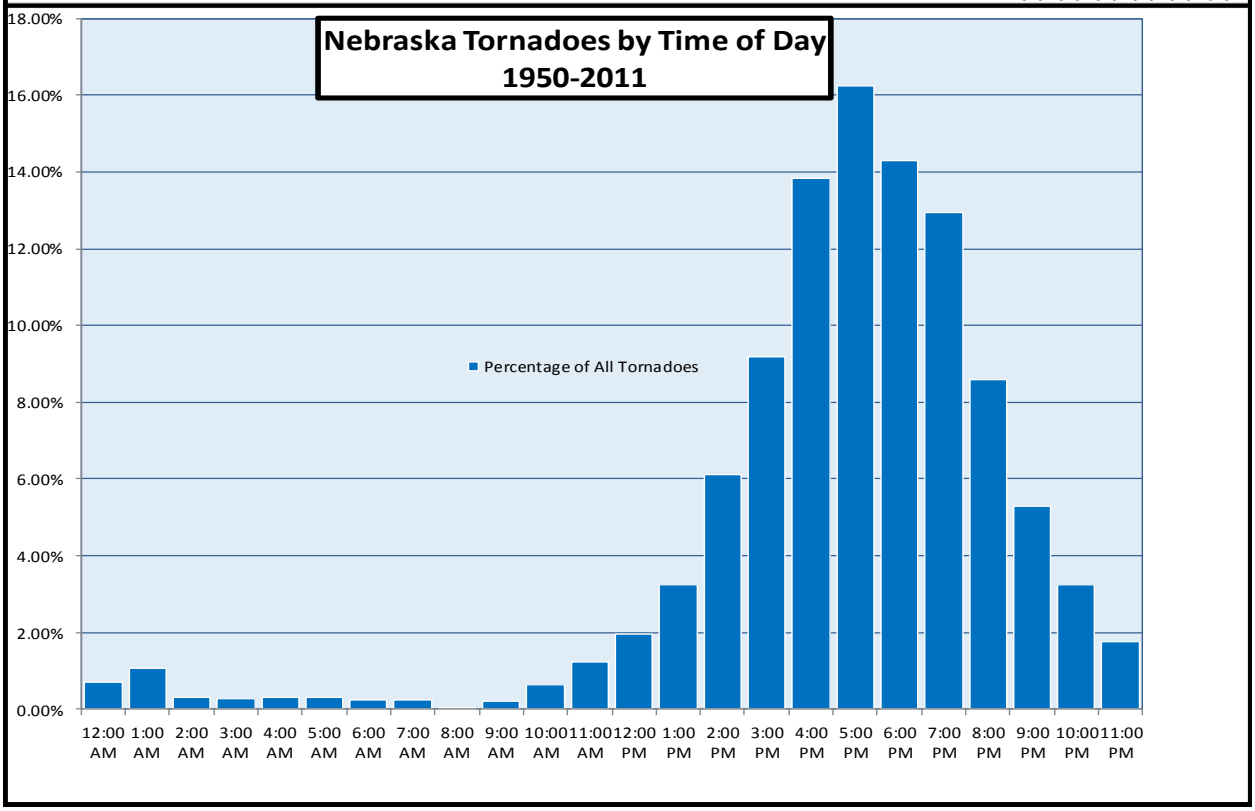
**Hail Size** - 4.25" (Softball size) on August 18th - Northeast of Bloomfield (Knox County), Northern and Eastern Omaha (Douglas County), and near Martinsburg (Dixon County)

**Wind Gust** - Estimated: 90 mph on May 30th (near Riverdale - Buffalo County)
Measured: 92 mph on August 18th (Eppley Airport - Douglas County)

# Nebraska
# Tornado Facts

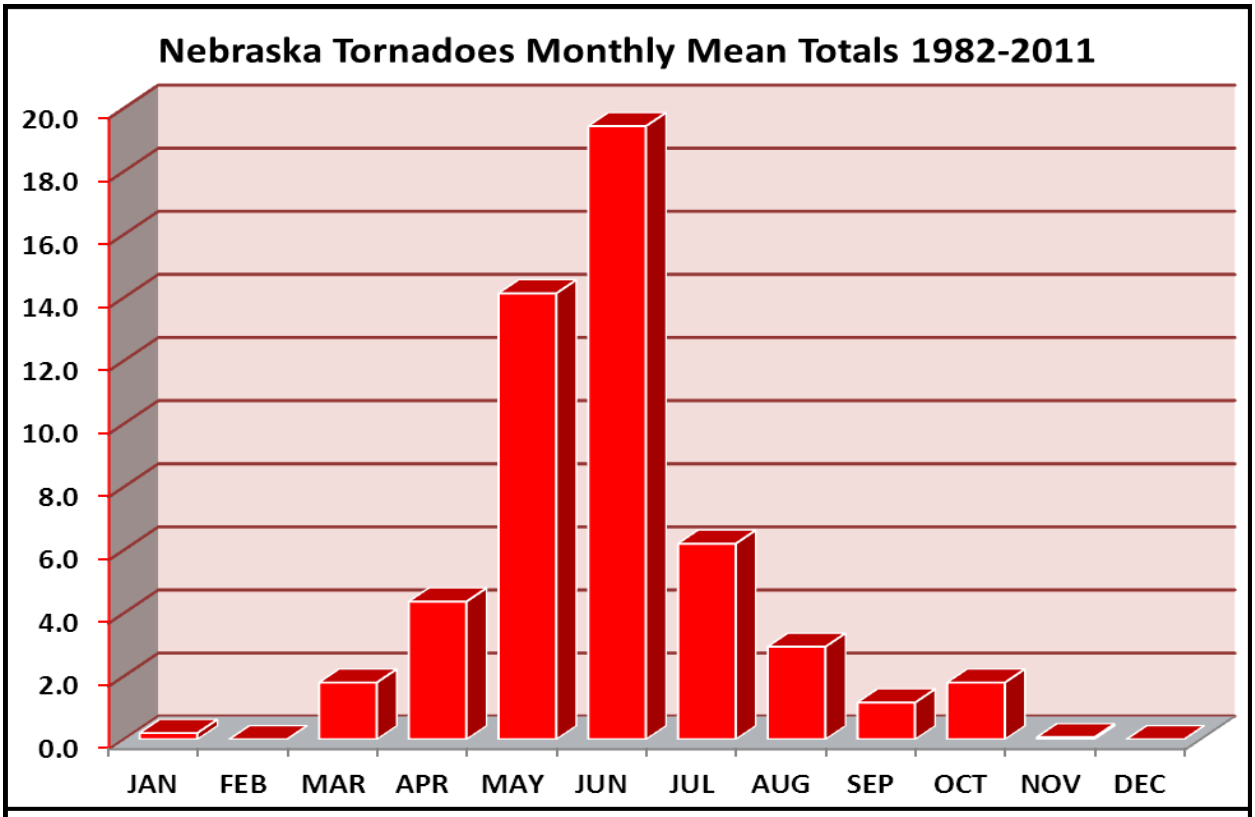
*Severe Weather Awareness Week - March 19th - 23rd*

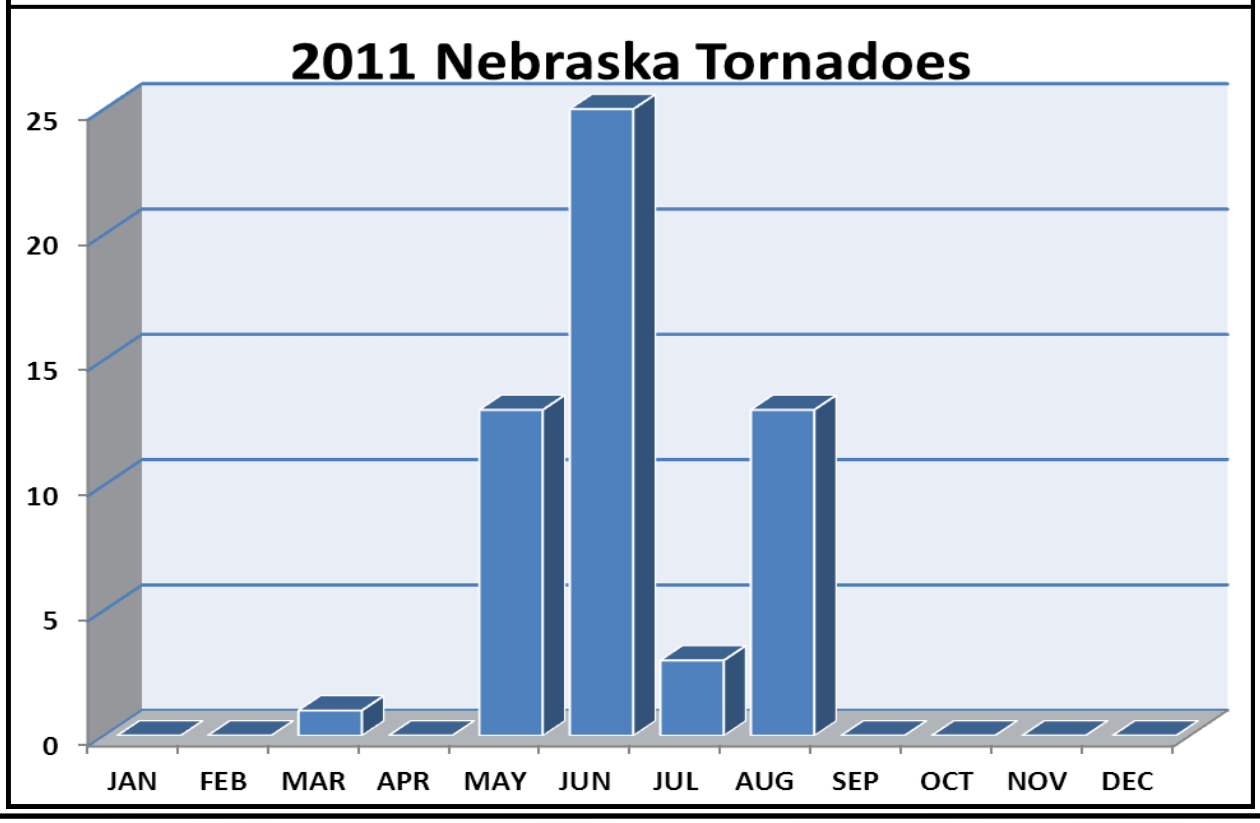


# Nebraska
# Tornado Facts

*Severe Weather Awareness Week - March 19th - 23rd*



# Weather-Ready Nation

*http://www.nws.noaa.gov/com/weatherreadynation/*

NOAA's Weather-Ready Nation is about building community resilience in the face of increasing vulnerability to extreme weather and water events. Record-breaking snowfall, cold temperatures, extended drought, high heat, severe flooding, violent tornadoes, and massive hurricanes have all combined to reach the greatest number of multi-billion dollar weather disasters in the nation's history.

The devastating impacts of extreme events can be reduced through improved readiness, which is why the Weather-Ready Nation initiative is so important. Through operational initiatives, NOAA's National Weather Service is transforming its operations to help America respond. In the end, emergency managers, first responders, government officials, businesses and the public will be empowered to make fast, smart decisions to save lives and livelihoods.

The initiative includes improvements in a wide range of areas to support management of the nation's water supply, understanding of climate-related risks, economic productivity, healthy communities and ecosystems. Building on past successes in decision support services, the NWS is launching community-based pilot projects across the country, ranging in focus from emergency response to integrated environmental services, to enhance the nation's preparedness. NOAA's Office of Oceanic and Atmospheric Research and National Environmental Satellite, Data, and Information Service are moving new science and technology into weather service operations that will improve forecasts, increase lead time and ultimately increase weather-readiness.

Building a Weather-Ready Nation starts with these internal actions, but requires the action of a vast nationwide network of partners including other government agencies and emergency managers, researchers, the media, insurance industry, non-profits, the private sector, the Weather Enterprise and more. Through a series of symposiums, the national dialog engages these partners in assessing why the nation is experiencing such extreme impacts. The goal of the dialog is to support the mission of the NWS by reducing risk and increasing community resilience for future extreme events. All of these actions fall under the umbrella of Weather-Ready Nation, and all support the same end goal: ***better information for better decisions.***


*Visit the website listed above for more information on how you can become Weather-Ready!*

## A Few Frequently Asked Questions:

**Who is involved in Weather-Ready Nation?**

Society's ability to prepare for natural disasters requires a societal response equal to the risk. Government cannot do this alone, which is why the NWS is leveraging its vast nationwide network of partners, and incorporating new partners who are beginning to share the vision of building a Weather-Ready Nation. Partners include other government agencies and emergency managers, researchers, the media, insurance industry, non-profits, the private sector and more.

**Why is America becoming increasingly vulnerable to weather events?**

The continued increase in the severity of impacts is attributable to societal changes represented in demographic trends, growing infrastructure threats, and an increased reliance on technology. U.S. population has almost doubled since 1954, which corresponds with higher property and infrastructure values. Trends such as urban sprawl and conversion of rural land to suburban landscapes increase the likelihood a tornado will impact densely populated areas.

The increased dependence on technology by both forecasters and the general public requires investments for regular updates, replacements and repairs.

More overlap in the U.S. economy means that a single weather event can have a significant effect on several industries. In fact, according to a study by the National Center for Atmospheric Research, weather can vary the economic output in the U.S. by $485 billion of the country's GDP annually. The study goes on to say that weather events affect "economic activity in every state and every sector."

# Severe Weather Terminology

*Severe Weather Awareness Week - March 19th - 23rd*

**SEVERE THUNDERSTORM -** A thunderstorm is considered severe when it produces any of the following: Hail 1" (quarter size) or larger in diameter, winds which equal or exceed 58 MPH or a tornado.

**FUNNEL CLOUD -** A funnel shaped cloud, usually extending from a convective cloud, which is associated with a violently rotating column of air that is NOT in contact with the ground.

**TORNADO -** A violently rotating column of air that extends from a convective cloud and is in contact with the ground. The entire column of air associated with a tornado is not always visible. A tornado may only be visible once it has picked up enough dirt and debris.

**HAZARDOUS WEATHER OUTLOOK -** A product which is issued daily, highlighting any potential significant weather in the area for the next 7 days.

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**WATCH -** Issued when conditions are favorable for the development of severe weather in and close to the watch area. The size of the watch can vary depending on the weather situation and is usually issued for a duration of 4 to 8 hours. During the watch, people should review severe weather safety rules and be prepared to move to a place of safety if threatening weather approaches.

**WARNING -** Issued when severe weather is detected by radar or reported by storm spotters. Information in this warning will include the location of the storm, what areas will be affected, and the primary threat associated with the storm. People in the affected area should seek safe shelter immediately. Remember that severe thunderstorms can produce tornadoes with little or no advance warning. Warnings can be issued without a watch already in effect.

**SIGNIFICANT WEATHER ADVISORY or SPECIAL WEATHER STATEMENT -** Issued for "near" severe thunderstorms. Typically issued for storms with 3/4" (penny sized) hail and wind gusts near 50 MPH, but can also be issued for large amounts of small hail covering the ground. It is also used as a "heads up" for ongoing severe storms which may move into the area.

**SEVERE WEATHER STATEMENT -** A product issued which provides follow-up information on any severe weather warnings in effect and conditions which have occurred or are occurring. This information includes updated storm paths and any storm reports, such as hail size or damage, received from spotters.

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**FLASH FLOOD -** A rapid rise in water that occurs with little or no advanced warning, usually as the result of intense rainfall over a relatively small area in a short amount of time. Flash Floods can also be caused by dam or levee failures, ice jams, and topography.

**FLASH FLOOD WATCH -** Issued to indicate current or developing hydrologic conditions that are favorable for flash flooding in and close to the watch area. When a watch is issued, be aware of any potential flood hazards. Those in the affected area are urged to be ready to take quick action if a Flash Flood Warning is issued or flooding is observed.

**FLASH FLOOD WARNING -** Issued when flash flooding is in progress, imminent, or highly likely. Those in the affected area should evacuate immediately or move to higher ground if possible. Information in this warning will include the locations in the flood and any areas which may be impacted. Flash Flood Warnings can be issued without a Flash Flood Watch in effect.

# Lightning Safety

*http://www.lightningsafety.noaa.gov*

One dangerous aspect of weather that sometimes is not taken as seriously as others is lightning. Summer is the peak season for one of the nation's deadliest weather phenomena, but don't be fooled, lightning strikes happen at all times of the year. In the United States, an average of 55 people are killed each year by lightning. In 2010, 29 people died due to lightning. In 2011, 26 people were struck and killed, while hundreds of others were permanently injured. Of the victims who were killed by lightning in 2011:

- 100% were outside
- 73% were male
- 54% were between the ages of 10 - 49
- 27% were in or near water
- 23% were camping

**When Thunder Roars, Go Indoors!**

The reported number of injuries is likely far lower than the actual total because many people do not seek help or doctors do not record it as a lightning injury. People struck by lightning suffer from a variety of long-term, debilitating symptoms, including memory loss, attention deficits, sleep disorders, and numbness.

***Avoid getting caught in a dangerous situation!***
***If you can hear thunder, you are close enough to be struck by lightning!***

- Move into a sturdy building or an automobile with a metal top. The frame of the building or of a metal car body will allow the charge to be conducted away from you.
- Outdoor activities such as golfing and baseball can present a risk to those in attendance, as these take place on a fairway or ball field, both of which are wide open. Those attending rodeos or concerts in open arenas, sitting on metal bleachers or under a metal overhang, are also at risk.
- Get out of boats and away from water, as water is an electrical conductor. On the open water, you may become the tallest object and a prime target.
- When indoors, avoid using any corded and electrical appliances. Also stay away from pools, tubs, showers, or any other plumbing. Electricity can travel through wiring and plumbing, posing a risk to those in contact.
- If someone is struck by lightning, get medical help immediately. With proper treatment, including CPR if necessary, most lightning victims survive.

## ***Did you know…***

***Thunderstorms do not have to be large in size or even severe to create potentially fatal lightning strikes!***

As a thunderstorm grows, areas of rising and descending air cause a separation of positively and negatively charged particles within the storm. At the same time, oppositely charged particles are gathering on the ground below. The attraction between the particles in the cloud and at the ground quickly grows, and once the force is strong enough to overcome the air's resistance, lightning occurs.

# Flash Flood Safety

*http://www.floodsafety.noaa.gov*

On average, more people are killed by flooding than by any other single severe weather hazard, including tornadoes, lightning, and hurricanes. Most of these deaths occur at night, when it is more difficult to recognize flood dangers, and when people are trapped in vehicles. Do you and your family know what to do in case of a flood?

**Remember…**


- **DO NOT** drive onto a flooded roadway.
- **DO NOT** drive through flowing water.
- If you approach a roadway that is flooded, **TURN AROUND - DON'T DROWN**.
- Drive with extreme caution if roads are even just wet or it is raining. You can lose control of your vehicle if hydroplaning occurs, which is when a layer of water builds up between your tires and the road, causing there to be no direct contact between your vehicle and the road.

**If a Flash Flood Warning is issued for your area…**

- **If advised to evacuate, do so *immediately*!** Act quickly to save yourself, you may not have much time.
- Get out of areas that are subject to flooding and move to a safe area before access is cut off by flood waters. Low spots such as dips, canyons, and washes are not the places you want to be during flooding!
- **DO NOT** camp or park your vehicle along streams and washes, particularly during threatening conditions.
- **DO NOT** drive if not necessary. If driving is necessary, do not attempt to drive over a flooded road, as the depth of the water is not always obvious, and the roadway may no longer be intact under the water. Never drive around a barricade, they are placed there for your protection! If your vehicle stalls, leave it immediately and move to higher ground before water sweeps you and your vehicle away.
- **DO NOT** try to walk, swim, or play in flood water. You may not be able to determine if there are holes or submerged debris, or how quickly the water is flowing, and you may be swept away. If water is moving swiftly, as little as 6 inches of water can knock you off of your feet! There is also a danger of hazardous materials polluting the water. Also remember that water is an electrical conductor, if there are power lines down, there is a possibility of electrocution.
- Always continue to monitor the situation through the National Weather Service website, your NOAA Weather Radio All-Hazards, or favorite local television or radio stations.

***Why is "Turn Around - Don't Drown" so important?***

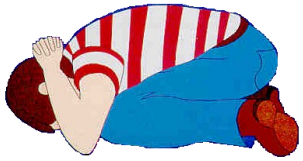
On average, more deaths occur due to flooding than from any other severe weather related hazard. The main reason is people underestimate the force and power of water. More than half of all flood related deaths result from vehicles being swept downstream. Of these, many are preventable.

# Tornado Safety

*Severe Weather Awareness Week - March 19th - 23rd*

Tornadoes can happen at any time of the year, and at any time during the day or night. Though more common in the afternoon and evening hours, tornadoes can happen and have been reported at 2 or 3 o'clock in the morning! Many people think a tornado is always visible, but there are times in storms which have high amounts of precipitation, it can be completely wrapped in rain, making it indistinguishable from surrounding clouds. Contrary to what some may believe, tornadoes can and do cross rivers, mountains, and big cities. For these reasons, it is very important to have a plan of action in case of a tornado.

**What should I do when a tornado is approaching or a warning has been issued?**



- **SEEK SHELTER *IMMEDIATELY!* Once in shelter, take the protection position.**

**Where do I go?**

- **Reinforced shelters** – A basement or underground shelter is the best option. Protect your head and eyes from deadly flying debris. If no basement is available, go to an interior area on the lowest floor, such as a bathroom or closet. If possible get under something sturdy like a bench or table. ***Always stay away from windows!***

**What should I do if I am located...**

- **Outdoors** – If you can drive away from the tornado, do so. On average, tornadoes move at 35 - 45 MPH, so driving away would be the first course of action.

  If you can't drive away from the tornado, as would be the case if you were driving directly toward the tornado on a divided highway or were stuck in slow moving traffic, abandon your vehicle and seek shelter in a nearby structure, such as a house or other well built structure.

  If no buildings are available and driving away is not an option: Stay in the car with the seat belt on. Put your head down below the windows, covering with your hands and a blanket if possible. If you can safely get noticeably lower than the level of the roadway, exit your car and lie in that area, covering your head with your hands. **NEVER** seek shelter under a bridge or overpass.

  The important thing to understand is that if you find yourself outside or in a car and you are unable to get to a safe shelter, you are at risk from a number of things outside your control, such as the strength and path of the tornado and debris from your surroundings. This is the case whether you stay in your car or seek shelter in a depression or ditch, both of which are considered last resort options that provide little protection. The safest place to be is always an underground shelter, basement or safe room.

- **In a Mobile Home** – Evacuate immediately! Mobile homes are particularly vulnerable to overturning and destruction from strong winds and tornadoes. Tie-downs generally will not protect a mobile home from tornadoes. If possible, leave the mobile home and go to a community shelter. If none is available, a ditch, culvert, or other low lying area may offer better protection. Have a plan of action prepared before a storm hits.

- **At School, Work, Shopping or in Other Buildings** – Stay indoors! Avoid cars, buses, or any other vehicle. Follow plans made in advance to go to a basement, an interior room or hallway on the lowest floor. Avoid the end of any hallway that opens to the outside as well as rooms with windows or outside walls. Stay out of auditoriums or any other structure with wide free-span roofs, as these types of structures are quite vulnerable to tornadic winds. Once you are in shelter, crouch down and cover your head!

# NOAA Weather Radio
# All Hazards

*http://www.weather.gov/nwr*

NOAA Weather Radio All Hazards (NWR) is a nationwide network of radio stations broadcasting continuous weather information directly from the nearest National Weather Service office. NWR broadcasts official Weather Service warnings, watches, forecasts and other hazard information 24 hours a day, 7 days a week.

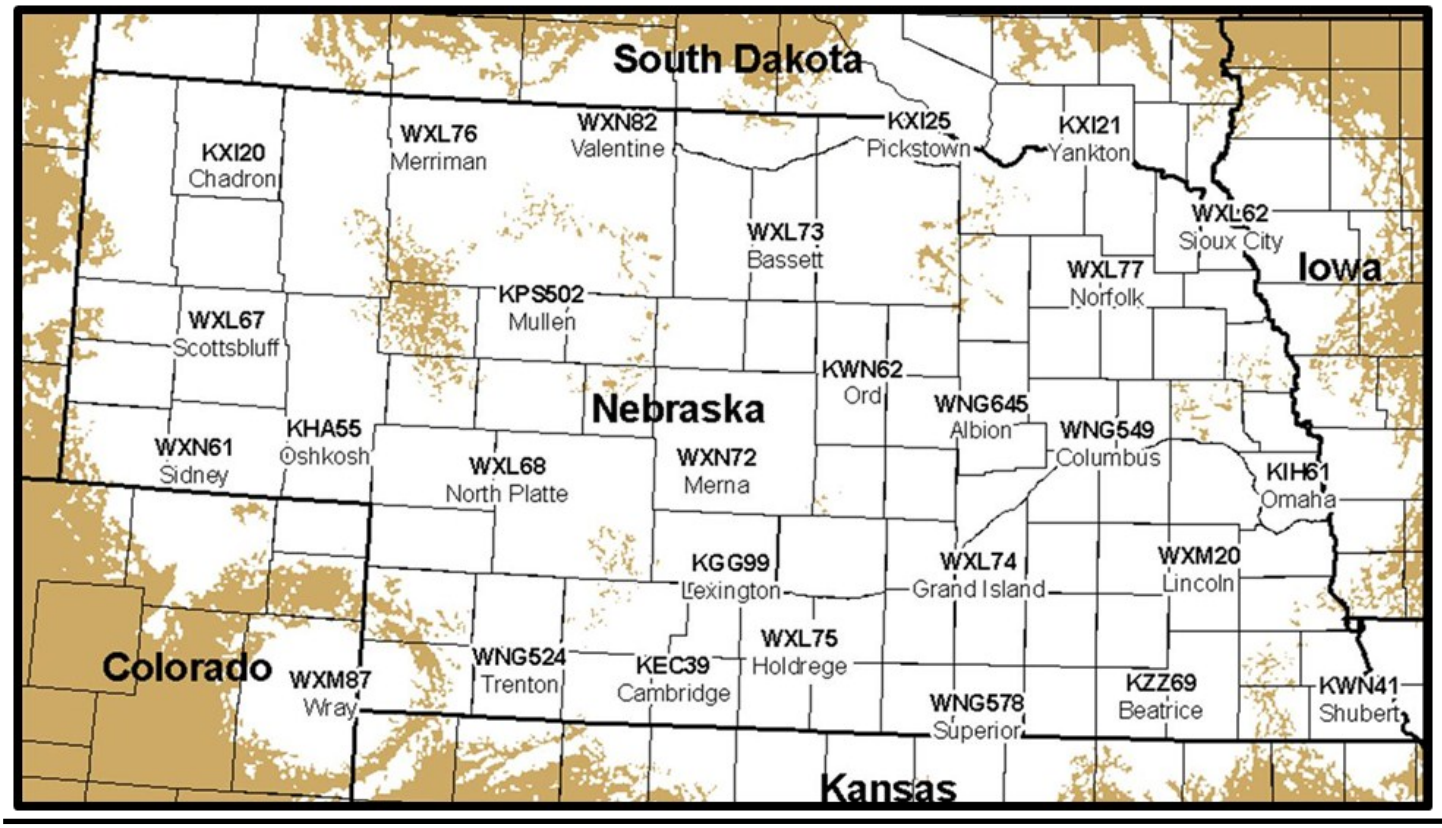
Working with the Federal Communication Commission's (FCC) Emergency Alert System, NWR is an "All Hazards" radio network, making it your single source for comprehensive weather and emergency information. In conjunction with Federal, State, and Local Emergency Managers and other public officials, NWR also broadcasts warning and post-event information for all types of hazards, including natural (such as tornadoes or floods), environmental (such as chemical releases or oil spills), and public safety (such as AMBER alerts or 911 Telephone outages).

Known as the "Voice of NOAA's National Weather Service," NWR is provided as a public service by the National Oceanic and Atmospheric Administration (NOAA). NWR includes 1000 transmitters, covering all 50 states, adjacent coastal waters, Puerto Rico, the U.S. Virgin Islands, and the U.S. Pacific Territories. NWR requires a special radio receiver or scanner capable of picking up the signal. Broadcasts are found in the VHF public service band at these seven frequencies (MHz):

| | | | | | | |
|---|---|---|---|---|---|---|
| 162.400 | 162.425 | 162.450 | 162.475 | 162.500 | 162.525 | 162.550 |

Coverage information and SAME Codes for every county in Nebraska can be found at:

***http://www.weather.gov/nwr/Maps/PHP/nebraska.php***



# 2011 Nebraska Severe Weather Summary

*http://www.weather.gov/cys*

## Nebraska Panhandle - NWS Cheyenne, WY

The 2011 severe weather season was a little slow in getting started, with no significant weather reported until **May 9th**. However, the first event was actually a tornado event that occurred in northern Sioux County. Around 6:35 p.m., a tornado briefly touched down in an open area 4 miles east of Harrison. In addition, this same event also had reports of large hail across portions of Sioux, Dawes, and Box Butte Counties. Several reports of golf ball size hail were received that evening, but the biggest hail was a report of baseball size hail 15 miles south of Chadron.

Widespread reports of severe weather were received on **June 11th**. Reports of quarter size hail and a little larger came in from Kimball, Cheyenne, Morrill, and Scotts Bluff Counties between 4:30 and 6 p.m. Estimated winds of 70 mph were reported northeast of Scottsbluff.

On **June 12th**, quarter size hail fell in Dawes County.

A significant hail storm occurred in Cheyenne County on **June 13th**. Between 6:30 and 7:30 p.m., widespread large hail fell across the county, causing many reports of damage to windows and cars. The hail was in the 1 to 2" range. In addition to the hail, there were reports of wind gusts to 65 mph.

During the evening of **June 16th**, a severe weather event produced many reports of hail, strong winds, and flash flooding across much of the Nebraska Panhandle. The first reports came in from Scottsbluff County, where hail up to 1-1/2" in size and wind gusts to around 70 mph were reported. Strong winds of around 65 mph were reported in Morrill County and numerous trees were blown down. In Box Butte County, quarter size hail and winds to 65 mph were reported. In the southern Panhandle in Kimball and Cheyenne Counties, 1" hail was reported. As the evening progressed, widespread heavy rain caused flash flooding in portions of Scotts Bluff, Morrill, and Cheyenne Counties.

On **June 18th**, storms developed in the Panhandle and at 2:00 p.m., law enforcement officials reported a brief tornado 3 miles west of Mitchell in Scotts Bluff County.

On **June 19th**, heavy rain across the southern Panhandle resulted in flash flooding in portions of Kimball and Cheyenne Counties. The official observation at the Sidney airport reported 3.43" of rain.

The last week of June saw several severe weather events. On **June 24th**, widespread reports of hail were received. Hail was reported in Sioux, Dawes, Kimball, Scotts Bluff, and Cheyenne Counties. Most of the reports of hail were in the 1 to 2" range, with the largest report coming in from 6 miles south of Dix in Kimball County and was the size of baseballs. In addition to the reports of hail, many reports of strong winds were also received. The reported gusts were in the 60 to 70 mph range.

Strong thunderstorms developed across the southern Panhandle on **June 25th**. Tornadoes were reported in both Kimball and Cheyenne Counties. Shortly before 7 p.m., a tornado was reported in open range 12 miles northeast of Kimball. About the same time, law enforcement reported a weak tornado 1 mile northwest of Sidney, but no damage was noted. Another storm produced downburst winds that blew down pine trees in Potter and a semi-trailer was blown over on Interstate 80 near Potter. In addition, large hail was also observed with these storm with the largest hail being 4" in diameter in Sidney.

**Nebraska Panhandle - NWS Cheyenne, WY Con't.**

On **June 26th**, severe weather once again occurred across the Panhandle with strong winds and large hail being reported in Scotts Bluff, Dawes, and Banner Counties. Winds estimated to around 60 mph were observed in Scotts Bluff and Banner Counties. Quarter size hail was reported in Chadron and 1-1/2" hail was observed 10 miles northeast of Harrisburg.

On **June 29th**, a strong thunderstorm produced 60 mph winds 15 miles east of Dalton in Cheyenne County.

On **June 30th**, severe weather occurred in portions of the Panhandle. A storm produced winds near 60 mph in Sioux County during the afternoon hours. These storms moved east into Dawes County and produced quarter size hail from 7 miles of Chadron into Chadron. This storm also produced strong winds estimated to be around 60 mph. Another storm in Cheyenne County produced a measured wind gust of 60 mph at the Sidney airport.

Severe weather continued into July. On **July 2nd**, storms produced hail, heavy rain, and flash flooding in Scotts Bluff and Banner Counties. Most reports of hail ranged from the size of quarters to golf balls. Water covered many county roads and Highway 92 between Lyman and Gering.

Fireworks and severe weather were observed on **July 4th**. During the late afternoon hours numerous funnel clouds were reported in Sioux, Scotts Bluff, and Dawes Counties. No actual tornado touchdowns were observed.

On **July 6th**, a storm produced 60 to 70 mph winds around Alliance.

Strong winds were reported on **July 8th** in Cheyenne County. The winds were estimated to be in the 60 to 70 mph range. The Sidney airport wind sensor measured a wind gust of 70 mph.

Storms produced severe weather on **July 11th** with strong winds and hail being reported. One storm produced wind gusts of around 60 mph in Scotts Bluff County and another storm produced a measured gust of 64 mph at the Sidney airport. Quarter size hail was reported in Dawes County as well as some gusty winds.

Widespread heavy rain resulted in flash flooding in Kimball and Cheyenne County on **July 13th**. Several county roads had water over them and portions of County Roads 113 and 155 in Cheyenne County were washed out! Portions of the town of Lodgepole observed flood water 6" deep.

On **July 14th**, a severe thunderstorm produced a tornado 17 miles northeast of Harrisburg as well as quarter size hail. No damage as reported from the tornado, as it moved over open range.

**July 16th** saw more heavy rain, hail, and strong winds in the Panhandle during the late evening hours. Between 10:15 and 10:30 p.m., golf ball size hail fell in Kimball County and was accompanied by torrential rain. Around the same time, wind gusts in the 60 mph range were observed in and around Bayard in Morrill County. Finally around midnight, large hail and wind gusts to around 60 mph were reported near Hemingford in Box Butte County.

On **July 19th**, thunderstorms produced strong and damaging wind across the Panhandle. The storms occurred between 9:00 and 10:30 p.m. Wind gusts over 60 mph were observed in Banner, Cheyenne, Morrill, and Box Butte Counties. The strongest wind report was a gust of 73 mph at the Alliance airport at 10:13 p.m.

# 2011 Nebraska Severe Weather Summary

*http://www.weather.gov/cys*

**Nebraska Panhandle - NWS Cheyenne, WY Con't.**

The last severe weather event in July was on the **25th**. A strong thunderstorm produced quarter size hail around Crawford in Dawes County between 6:00 and 6:30 p.m.

Severe weather was reported in the Panhandle on **August 4th**. Late afternoon and evening thunderstorms developed and produced quarter size hail in Sioux County, as well as a wind gust of 72 mph at the Alliance airport in Box Butte County.

On **August 7th**, a storm produced quarter to half dollar size hail near Dalton in Cheyenne County.

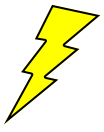
Strong storms moved across the southern Panhandle during two events on **August 9th**. An early show occurred between 2:00 and 3:00 p.m. in Cheyenne County. Hail ranged from quarter size to nearly tennis ball size. The largest hail reported was 2-1/4" in diameter and was reported 2 miles southeast of Sidney. In addition, a funnel cloud was also reported with this storm. The second event for this date occurred between 8:30 and 10 p.m. One to two inch hail fell in Banner, Kimball, and Cheyenne Counties. The 2" hail fell a mile and a half southeast of Sidney.

A late afternoon thunderstorm on **August 10th** resulted in the report from law enforcement of a weak tornado 2 miles southeast of Bushnell in Kimball County. The tornado was in open country and no damage was reported.

Kimball County was hit with severe weather again on **August 14th** when an afternoon thunderstorm produced golf ball size hail 15 miles southeast of Bushnell.

The last severe weather event for the season in the Nebraska Panhandle occurred on **August 29th**. Storms began around noon and the reports of heavy rain began. Reports of 1 to 2" an hour came in from Cheyenne and Morrill Counties. In addition, reports of flash flooding were received southeast of Sidney, with water flowing over County Roads 113 and 14. During the afternoon, storms also produced strong winds in Sioux County with winds estimated to be around 60 mph and snapping off branches 4 to 5" in diameter. These storms also produced quarter size hail east of Harrison. Shortly after 5 p.m., reports of a weak tornado were received from the public 5 miles south of Chadron. Damaged to a tree and windmill was reported. There were also reports of wind damage 3 miles southwest of Chadron. The damage was limited to tree branches being broken.

## ***Lightning Myths vs. Lightning Facts***



**Myth** - If it is not raining, then there is no danger from lightning.

**Fact** - Lightning often strikes outside of heavy rain and may occur as far as 10 miles away from any rainfall.

**Myth** - Structures with metal or metal on the body attract lightning

**Fact** - Height, pointy shape, and isolation are the dominant factors controlling where a lightning bolt will strike. The presence of metal makes virtually no difference on where lightning strikes.

**Myth** - Lightning never strikes the same place twice.

**Fact** - Lightning often strikes the same place repeatedly, especially if it is a tall, pointy, and isolated object.

**Myth** - The rubber soles of the shoes or rubber tires on a car will protect you from being struck by lightning.

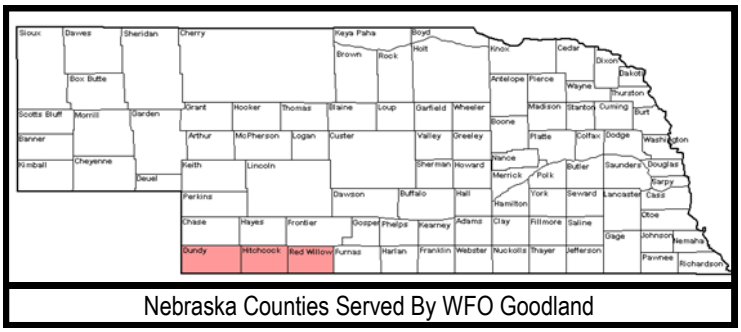
**Fact** - Rubber-soled shoes and rubber tires provide no protection from lightning. The steel frame of a hard-topped vehicle provides increased protection if you are not touching metal. Although you may be injured if lightning strikes your car, you are much safer inside a vehicle than outside.

# 2011 Nebraska Severe Weather Summary

*http://www.weather.gov/gld*

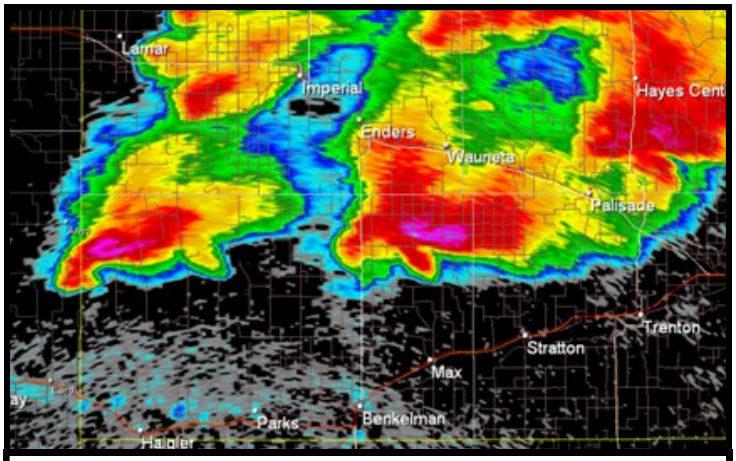
## Southwestern Nebraska - NWS Goodland, KS

The first three months of 2011 were quiet in terms of weather in our three Nebraska counties. The first significant storm of the season arrived on **April 14th**, producing blizzard conditions across Dundy County which resulted in power outages and road closures. Meanwhile, further east across Red Willow County, the same storm system brought the first severe weather reports to the area when penny size hail fell near McCook during the afternoon. Later in the month on **April 29th**, a strong cold front produced 61 mph winds at the McCook airport.



Nebraska Counties Served By WFO Goodland

On **May 23rd**, three separate rounds of thunderstorms moved through Red Willow County overnight. One storm produced a lightning strike which struck the transmitter tower at KNGN in McCook, which ultimately knocked the station off the air until repairs could be made.



Twin supercells rolling east across northern Dundy and Hitchcock counties on June 19th.

One big severe weather day in southwest Nebraska occurred **June 19th** during the evening when a series of intense supercell thunderstorms moved east. The result was three EF0 tornadoes, two in Dundy and one in Red Willow County. The following day, **June 20th**, the same storm system produced flooding over Red Willow County when four inches of rain fell in 90 minutes, closing roads temporarily between Danbury and McCook.


Hail in McCook around 4:00 p.m. on August 9th.
Photo courtesy of Jesse Miracle.

The month of August brought two back-to-back severe weather days which were noted for large hail and damaging winds. On **August 8th**, thunderstorms rolled southeast across Hitchcock County, producing baseball size hail which damaged house siding and broke windows.

The following day, **August 9th**, a more significant storm moved southeast resulting in golf ball to baseball hail and 65 mph winds. Crop damage alone was estimated at $10 million in Red Willow County, and property damage was also extensive with siding, windows and vehicles damaged. One person was injured when a skylight broke and showered glass onto shoppers at a department store. Another person suffered a broken thumb when she was hit by a hailstone, and still another had glass blown in her face and eyes when hail broke a store window in front of her.

Following these storms in August, the remainder of the year was fairly quiet in terms of severe weather.

# 2011 Nebraska Severe Weather Summary

*http://www.weather.gov/lbf*

## Western & North Central Nebraska - NWS North Platte, NE

Historic flooding along the North Platte River, tornadoes, large hail and damaging straight line winds impacted western and north central Nebraska during the spring and summer of 2011. Below is a sample of the most significant weather events which hit the area during the past severe weather season.

Flooding along North Platte River Road in North Platte. Photo taken June 22nd.

Record snowfall fell across the mountains of northern Colorado and southern Wyoming during the winter of 2010-2011. Due to record snowfall in the North Platte River Basin, upstream reservoirs in Wyoming, as well as Lake McConaughy, began releasing large amounts of water in March 2011. The North Platte River at North Platte, went above the flood stage of 6.00 feet on March 11th and remained there until October 8th. The river crested at 7.69 feet on June 3rd which was nearly a foot over the record stage set previously in 1971. Property damage occurred along the river at both Lewellen and North Platte with damage to roads, property and bridges. At North Platte, water inundated some basements and crawlspaces on the north side of the city. Along Washboard road and North River road, residents battled flood waters by sandbagging. As flooding worsened by June, the Army Corps of Engineers (USACE), began to build a series of temporary and permanent dikes on the north and northeast side of North Platte. In addition to building levees, USACE airlifted sandbags which were placed along the east bank of the North Platte river east of North Platte. These sandbags were dropped in place to protect residents living along North Airport road, Highway 30, and the North Platte Regional Airport from major flooding. High river levels continued along the North Platte River into October as additional releases of water continued from Lake McConaughy. This was necessary to allow for increased water storage space in Lake McConaughy for snowmelt runoff this upcoming spring.

EF3 Tornado South of Wood Lake on August 11th. Photo courtesy of Rob Brawner.

Tornadoes typically peak in June across western and north central Nebraska. In 2011, August saw the highest occurrence of tornadoes, with 9 confirmed. On **August 11th**, a total of 7 tornadoes touched down across north central Nebraska. All were associated with supercell thunderstorms which developed southeast of Valentine. As these storms moved southeast, they intensified, producing the first tornado just west of Wood Lake at 7:49 PM. This was a brief touchdown with no damage reported. The next two tornadoes touched down near Wood Lake and north of the Ainsworth Municipal Airport. The tornado south of Wood Lake destroyed an outbuilding and moved a calving shed nearly 100 yards, and was rated EF1. The largest, and most damaging tornado, touched down around 8:00 PM 5 miles southeast of Wood Lake. This tornado was up to a half a mile wide and was on the ground for approximately 20 minutes. Several windmills were damaged and significant damage to two shelter belts near an abandoned farmstead was reported. The tornado was rated an EF3 with winds estimated at 140 MPH. Three additional EF0 tornadoes touched down around Johnstown in Brown county and west of Purdum in Thomas county.

# 2011 Nebraska Severe Weather Summary

*http://www.weather.gov/lbf*

**Western & North Central Nebraska - NWS North Platte, NE Con't.**

Severe thunderstorms developed across the western Sandhills on **August 8th**, and moved southeast into southwestern Nebraska. As storms tracked across southwestern Nebraska, large hail up to baseball size was reported, resulting in widespread crop damage. Crop damage alone from the storms was estimated around three million dollars. In addition to crop damage, numerous windows were broken out of vehicles and homes in the Wallace and Sutherland areas.

Hail damage to crops on August 8th in Chase county.
Photo courtesy of Cory Schuller.

## Are you a *Storm*Ready Community?

Americans live in the most severe weather-prone country on Earth. Each year, Americans cope with an average of 10,000 severe thunderstorms, 5,000 floods, 1,000 tornadoes, and an average of 2 land falling deadly hurricanes. And this on top of winter storms, intense summer heat, high winds, wild fires and other deadly weather impacts. You can make sure your community is ready for the weather with the National Weather Service's StormReady program.

Some 90% of all presidentially declared disasters are weather related, leading to around 500 deaths per year and nearly $14 billion in damage. StormReady, a program started in 1999 in Tulsa, OK, helps arm America's communities with the communication and safety skills needed to save lives and property–before and during the event. StormReady helps community leaders and emergency managers strengthen local safety programs.

StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather—from tornadoes to tsunamis. The program encourages communities to take a new, proactive approach to improving local hazardous weather operations by providing emergency managers with clear-cut guidelines on how to improve their hazardous weather operations.

To be officially StormReady, a community must:

- Establish a 24-hour warning point and emergency operations center
- Have more than one way to receive severe weather warnings and forecasts and to alert the public
- Create a system that monitors weather conditions locally
- Promote the importance of public readiness through community seminars
- Develop a formal hazardous weather plan, which includes training severe weather spotters and emergency exercises.

For more information, visit: ***http://www.stormready.noaa.gov/***

# 2011 Nebraska Severe Weather Summary

*http://www.weather.gov/gid*

## South Central Nebraska - NWS Hastings, NE

**May 11th & 12th** - For two days in a row, severe thunderstorms pounded portions of South Central Nebraska, especially east of Highway 281. These storms brought heavy rainfall (in excess of 4-5" for some locations), hail and winds, along with 5 brief, weak tornadoes. The 2 tornadoes on the 11th were rated EF1, and the 3 on the 12th were rated EF0, and the 5 tornadoes were split between Polk (3) and Hamilton (2) Counties. One of the tornadoes on the 11th actually skipped over the middle of Osceola, touching down and causing damage on both the south and north sides of town. The path of the other EF1 tornado remained in rural areas between Hordville and Hampton, knocking over pivots, damaging trees and grain bins.

**Memorial Day (May 30th)** - May certainly went out with a bang, as a strong cold front and upper level low pressure system took aim on the Central Plains. This system spawned an expansive line of strong to severe thunderstorms that marched across much of the coverage area. Although there were some areas that saw hail to the size of quarters or larger, by far the biggest impact from these storms was widespread and very damaging straight-line winds, with gusts in the 60-90 MPH range in some areas, and possibly locally higher. Along the leading (front) edge of this line of storms, there were also several reports of tornadoes. However, based on accounts from storm spotters and chasers, many of these tornadoes were actually gustnadoes associated with small-scale circulations along the gust front at the *leading edge* of the storms. Damage was reported in the Ord area, with the ASOS at the Ord Airport reporting a gust of 83 mph. The roof was ripped off one of the hangars at the airport, and west of Ord, damage to grain bins and pivots was reported. The city of Grand Island also sustained damage, with a storage facility on west Highway 30 destroyed by straight-line winds. A train west of Grand Island was also derailed.

Damaged hanger at the Ord Airport on Memorial Day.

**June 14th through 19th** - Another weak, short-lived tornado was reported between Fullerton and Central City in northern Merrick County on the 14th, along with other reports of pea to golf ball size hail and gusts up to 60 mph across areas north of Interstate 80. A few days later on the 16th, severe weather struck again, in the form of strong winds, and was confined primarily to portions of Dawson County. Wind gusts estimated at 70 mph were reported near Gothenburg, while road signs were blown over along Highway 30 near Cozad. The ASOS at the Lexington Airport measured a wind gust of 62 mph. The evening and overnight hours of the 19th brought another round of thunderstorms, with a corridor of severe reports extending generally along a line running northeast from near Cambridge to Silver Creek. Strong thunderstorm winds resulted in a garage and barn being destroyed near Arapahoe around 9-10 p.m., then several hours later, closer to 2 a.m., an old grain elevator was reported blown down on Highway 30 between Clarks and Silver Creek.

**July 5th** - Fireworks continued as another round of large hail, damaging winds, and heavy rain affected the western and eastern fringes of the coverage area. Activity first got going during the mid-afternoon hours, impacting areas east of Highway 281, and brought up to golf ball size hail and wind gusts of 60 MPH. Portions of Polk County also saw 3-4" of rain, with 4.20" reported in Osceola and 3.46" reported just west of Shelby. While the area never saw a complete break from thunderstorm activity, the second round of severe weather held off until the mid to late evening hours, with the main impact being felt across Dawson and Phelps Counties. Once again hail up to the size of golf balls was reported, as were wind gusts of 60 to 70 mph. Northern portions of Dawson County also received several inches of rain.

Tornado between Fullerton and Silver Creek. Courtesy of Cecil Smalley.

# 2011 Nebraska Severe Weather Summary

*http://www.weather.gov/gid*

**South Central Nebraska - NWS Hastings, NE Con't.**

## *Tornado Outbreak of June 20th*

Residence completely destroyed north of Amherst.
Photo from NWS Storm Survey.

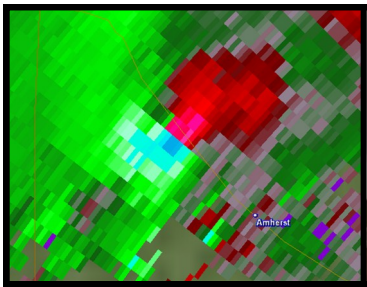
With 12 confirmed tornadoes, several of them significant, this Monday afternoon proved to be one of the most active severe weather days of 2011, and the most active tornado day in over three years within the Hastings County Warning Area, since May 29, 2008. This severe weather outbreak primarily targeted western and northeast portions of the area, largely sparing locations south of the Highway 6 corridor between Holdrege and Geneva. The final tornado breakdown per the EF-Scale included two EF-3, four EF-2, three EF-1 and three EF-0. Despite considerable damage to mainly rural residences, these tornadoes resulted in no fatalities and only one known non-life threatening injury when a semi-truck was tipped over near Elm Creek in Buffalo County. This Elm Creek tornado was also the only one to directly strike a community, although there were several close calls within a mile or two of places such as Amherst, Hampton and Bradshaw. Interestingly, tornadic storms also spared the immediate Tri-City population centers of Grand Island, Hastings and Kearney, despite damaging events occurring nearby to both the west and the east. This was largely due to the fact that an expansive mid-level dry intrusion became anchored over central sections of South Central Nebraska and North Central Kansas, "protecting" this area from storm development.

Mangled tractor and scoured crops along path of an EF3 tornado approximately 6 miles west of Osceola, near Highway 92.
Photo from NWS Storm Survey.

Taking a backseat to significant tornadoes on this day were hail and heavy rainfall. Some of the largest reported hailstones included baseball size in Buffalo County, and tennis ball size in York County. Rainfall-wise, although there were no widespread flooding impacts, localized rural flooding occurred as many locations received 1 to 3" in a rather short time. Some of the northwestern portions of South Central Nebraska, including parts of Valley, Greeley and Sherman Counties, measured 48-hour rainfall totals into the 3 to 4" range.

Much more information about this event (including photos) can be found by going to the link below:

**http://www.crh.noaa.gov/gid/?n=multipletornadoesjune202011**



KUEX radar storm relative velocity signature approximately 4 miles northeast of Amherst.

Tornado 6 miles west of Osceola on Highway 92.
Photo courtesy of Greg Dumas.

Tornado 5 miles south of Elm Creek just east of Highway 183.
Photo courtesy of Bryce Kintigh.

Tornado a few miles northeast of Bradshaw.
Photo courtesy of Doug Raflik.

# 2011 Nebraska Severe Weather Summary

*http://www.weather.gov/oax*

## Eastern Nebraska - NWS Omaha, NE

The 2011 convective season was probably best remembered for extensive flooding along the Missouri River, most of which was caused by rain/snow melt that occurred far removed from eastern Nebraska. However, several hailstorms were notable, and a couple of June events produced several weak tornadoes or modestly widespread wind damage.

Officially there were 6 weak, EF 0 or EF1, tornadoes recorded in eastern Nebraska during the 2011 severe weather season, 3 of which occurred on June 20th. The most newsworthy of those 3 was an EF1 tornado that tracked across Fremont, causing damage to the local YMCA among other structural, vehicular and tree damage. At a little over 6 miles, the track of the Fremont tornado was not the longest to occur in the 2011 season. That distinction went to another tornado observed that day, a 12 mile long path-length EF1 tornado that tracked across Pierce county. Eastern Nebraska tornadoes during 2011; location, strength, approximate track length, and time/date of touchdown include…

- Burt county, EF1, 2 ½ miles, 4:40 p.m. CDT, March 22nd
- Dodge county, EF0, 3 miles, 6:50 p.m. CDT, June 17th
- Pierce county, EF1, 12 miles, 7:27 p.m. CDT, June 20th
- Dodge county, EF1, 6 ½ miles, 8:00 p.m. CDT, June 20th
- Washington county, EF1, 7 miles, 8:09 p.m. CDT, June 20th
- Antelope county, EF0, 1 mile, 5:46 p.m. CDT, August 18th

For employees of the National Weather Service (NWS) Office in Valley, and for other residents of eastern Nebraska, the severe weather season started off with a bang on **March 22nd**. A broken line of severe thunderstorms brought destructive hail to the NWS office near Valley that day, as well as to surrounding communities. All vehicles at the NWS office, as well as those at nearby Valmont Industries, sustained major damage and many were totaled. This line of storms also produced the areas first tornado of 2011; a weak relatively brief touchdown near Craig in Burt county.

Vehicle damage at the NWS office from the March 22nd hailstorm.

Several other severe weather episodes occurred the rest of that spring and early summer; including a storm that produced baseball-size or larger hail in the Norfolk area on **April 9th**, and two late June episodes that brought tornadoes or strong winds. The **June 20th** outbreak that produced 3 officially recorded tornadoes in eastern Nebraska, including the Fremont storm, also brought 70 mph or greater winds to other locations in eastern Nebraska including a 72 mph gust at the NWS office near Valley. A line of severe thunderstorms on **June 26th** and early on the **27th** brought widespread wind damage to an area from near Battle Creek to Norfolk with a 79 mph gust recorded at the Norfolk ASOS.

Although there were the usual scattering of severe weather events in July, and of course the persistent Missouri River flooding, July may be most remembered by a prolonged excessive heat wave across eastern Nebraska from **July 15th through the 23rd**. High temperatures during that time climbed into the 90s and occasionally a little over 100 degrees, while dew point temperatures were in the 70s and lower 80s. The combination of heat and humidity pushed late morning and afternoon heat index values into the 105 to 120 degree range. Overnight lows provided little relief, dropping no lower than the 70s to around 80 degrees, including a 4-day stretch in Omaha from July 17th through the 20th that saw lows of 80 degrees or warmer.

# 2011 Nebraska Severe Weather Summary

*http://www.weather.gov/oax*

**Eastern Central Nebraska - NWS Omaha, NE Con't.**

August brought several severe weather events that especially impacted the greater Omaha area. The first event occurred on **August 18th** when several super-cell thunderstorms raked along and east of the Missouri River. These storms brought very large hail at times, driven by winds in excess of 70 mph. The first of these storms caused extensive house and vehicle damage to the east part of Omaha, including vehicles parked outside at Eppley Airport, as hail up to softball-size was observed. The ASOS equipment at Eppley measured a wind gust of a little over 60 mph from this storm and the wind driven hail seriously injured a pilot of a major airline caught on the loading ramp. Meanwhile, farther to the west, another storm associated with this event produced the season's last tornado, a weak touchdown in Antelope county near Neligh. A few hours later another super-cell thunderstorm dropped across the eastern Omaha area producing wind gusts of 60 to 80+ mph, with wind shear measuring equipment on one of Eppley's runways recording a wind gust around 90 mph. The wind-driven rain caused extensive damage to the interior of vehicles that had their windows broken out by the first storm. This storm and the prior one went on to cause extensive property and crop damage in southwest Iowa.

During the early morning hours of **August 22nd**, heavy rain producing thunderstorms repeatedly tracked southeast across the Omaha metro area and locations to the northwest and southeast. This produced a 30 to 50 mile wide swath of 2 to 4" or greater rainfall that stretched from just southeast of West Point through Omaha and then across southwest Iowa. In Omaha there were some reports of over 5" of rain, which caused minor flash flooding in the downtown area.

Speaking of flooding, the unprecedented and persistent flooding of the Missouri River produced several record stages in late June, including around 45 feet at Brownville, 28 feet at Nebraska City and around 27 feet near Rulo. The flooding was caused by record spring rainfall in eastern Montana and North Dakota, unusually high levels of snow melt, and additional heavy-rain producing summer thunderstorms in the upper basin. All of these events contributed to a record 160,000+ cfs release out of Gavins Point Dam, the last reservoir in the Missouri River chain. Although the flooding along the Missouri River was more pronounced in western Iowa; homes, cabins, many roads and some highways were flooded along the length of the Missouri River in eastern Nebraska downstream of Gavins Point. In addition, the flooding kept the Ft. Calhoun nuclear power plant closed all summer as flood waters encircled the plant, and they also briefly threatened to reach the Cooper Nuclear plant near Brownville. Although the record outflows and significant flooding continued most of the summer, measured river levels fell after June as Iowa levees were breached or destroyed.

## ***Did you know?***

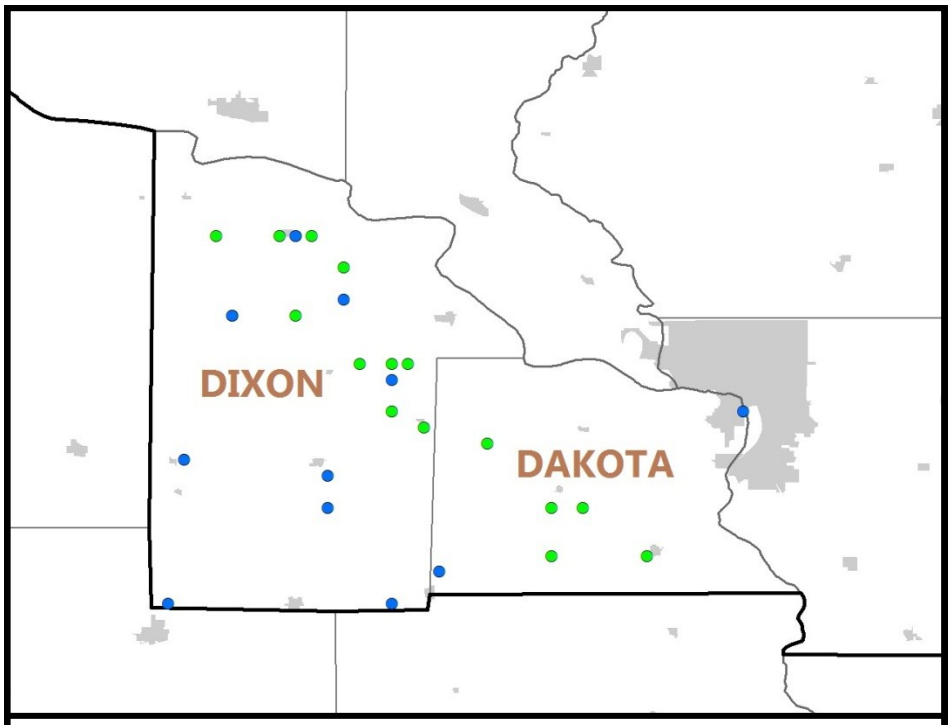
- The average tornado moves from southwest to northeast, but have been known to move in any direction. Its average forward speed is 35 - 45 mph, but may vary from nearly stationary to 70 mph! Tornadoes are most likely to occur between 3 & 9 p.m., but have been reported at all hours of the day or night.
- Lightning can occur from cloud-to-cloud, within a cloud, cloud-to-ground, or cloud-to-air.
- A downburst is a small area of rapidly descending air beneath a thunderstorm. Once this air hits the ground, it spreads out, causing potentially damaging straight-line winds. Downbursts present an extreme danger to aviation.
- Large hail stones can fall at speeds greater than 100 miles per hour.
- The largest hailstone ever recorded in the United States fell in Vivian, South Dakota, on July 23, 2010. This hailstone had a 8 inch diameter and weighed 1.94 lbs.

# 2011 Nebraska Severe Weather Summary

*http://www.weather.gov/fsd*

## Northeastern Nebraska - NWS Sioux Falls, SD

During the spring and summer seasons of 2011, a number of atmospheric disturbances brought periods of severe weather to the northeastern corner of Nebraska, resulting in 28 total severe hail and wind reports. Many of these reports occurred within five main events, which are described below. In addition, major flooding along the Missouri River began impacting lowlands around across northeast Nebraska on May 25th, and continued through September. The highest stage on the Missouri River near Ponca, NE was recorded at 8.6 feet above flood stage on August 1st.




Severe weather reports from April 1 – October 1, 2011. Severe wind reports (gusts ≥ 58 mph) are denoted in blue, and severe hail reports (diameter ≥ 1.00") are in green. Urban areas are shaded in gray.

### April 9th

Surface low pressure moved into portions of southwest Nebraska, extending a warm front across eastern Nebraska during the early evening. Instability was very strong along and south of the frontal boundary, allowing supercells to develop across northeastern portions of the state. Hail up to half dollar size in diameter was reported across northeast Nebraska during the evening; however, larger hail and several tornadoes were reported as the storms developed across northwest Iowa.

### May 11th

Supercells developed along a warm front across east central Nebraska during the afternoon of May 11th. As the front lifted northward, these storms became more linear, switching the main threat to severe straight line winds. Severe winds of 60 mph were reported across Dakota county, and a few brief spin-ups were reported as the storms gusted out across far southeastern South Dakota.

### May 21st

Thunderstorms developed across central Nebraska during the early afternoon along the remnants of a previous storm's outflow boundary. These storms shifted slowly to the east northeast by early evening, producing swaths of hail throughout the eastern third of the state. Hail up to golf ball size in diameter was reported in Dixon county, then storms decreased in intensity as they moved into northwest Iowa.

### June 26th

A large cluster of severe thunderstorms formed across south central South Dakota during the afternoon, then began moving quickly to the east southeast into a very unstable environment. By early evening, this conglomeration of storms had developed into a bow echo, producing severe wind gusts and damage across much of northern Nebraska. 60 mph winds were reported in Dixon county; however, higher wind speeds of 70-80 mph were reported nearby in association with this damaging wind storm.

# 2011 Nebraska Severe Weather Summary

*http://www.weather.gov/fsd*

## Northeastern Nebraska - NWS Sioux Falls, SD Con't.

### August 18th

Several thunderstorms developed along a weak surface boundary across eastern Nebraska in the early afternoon on August 18th. Very strong surface-based instability and strong vertical shear lead to explosive severe storm development in the northeastern corner of the state, resulting in a dominant supercell which drifted southeast across Dixon and Dakota counties. Giant hail up to grapefruit size was reported in association with this storm, as well as damaging wind gusts up to 76 mph. Crop and property damage in excess of $400,000 was reported across Dixon and Dakota counties.

Photo of crop damage by NWS Sioux Falls.

### Rainfall Statistics

Through the end of August, many locations across the Northern Plains were above average for precipitation – further compounding flooding issues along the Missouri River. On August 31st, Newcastle was 130% of normal for year to date precipitation, while Wakefield was approximately 110% of normal. However, September marked the beginning of a drought that lasted through the end of the convective season, with less than two inches of total precipitation in September and October at both locations.

| | Apr | May | Jun | Jul | Aug | Sep | Total | Avg |
|---|---|---|---|---|---|---|---|---|
| **Wakefield** | 3.81 | 5.48 | 3.99 | 1.54 | 6.21 | 0.60 | **21.63** | **21.50** |
| **Newcastle** | 5.40 | 7.06 | 4.60 | 2.83 | 4.13 | 1.03 | **25.05** | **21.00** |

## *Tornado True or False*

1 - Highway and interstate overpasses are safe shelters against a tornado.

**False!** Overpasses can concentrate the tornado winds, causing them to be significantly stronger. People under them are in an even more dangerous situation, and some have been killed or severely injured. Being above ground level during a tornado is dangerous.

2 - Low pressure with a tornado causes buildings to explode. Opening the windows will equalize the pressure, saving the building.

**False!** Opening the windows in an attempt to equalize pressure will have no effect, it is the violent winds and debris that cause most structural damage. It is more important for you to move to a safe area away from windows and exterior walls. With a tornado, every second counts, so use your time wisely and take cover!

3 - You may not always see a tornado coming.

**True!** While most tornadoes do have a visible funnel, it is not always the case. Tornadoes can be hidden by trees, terrain, or even be wrapped in rain.

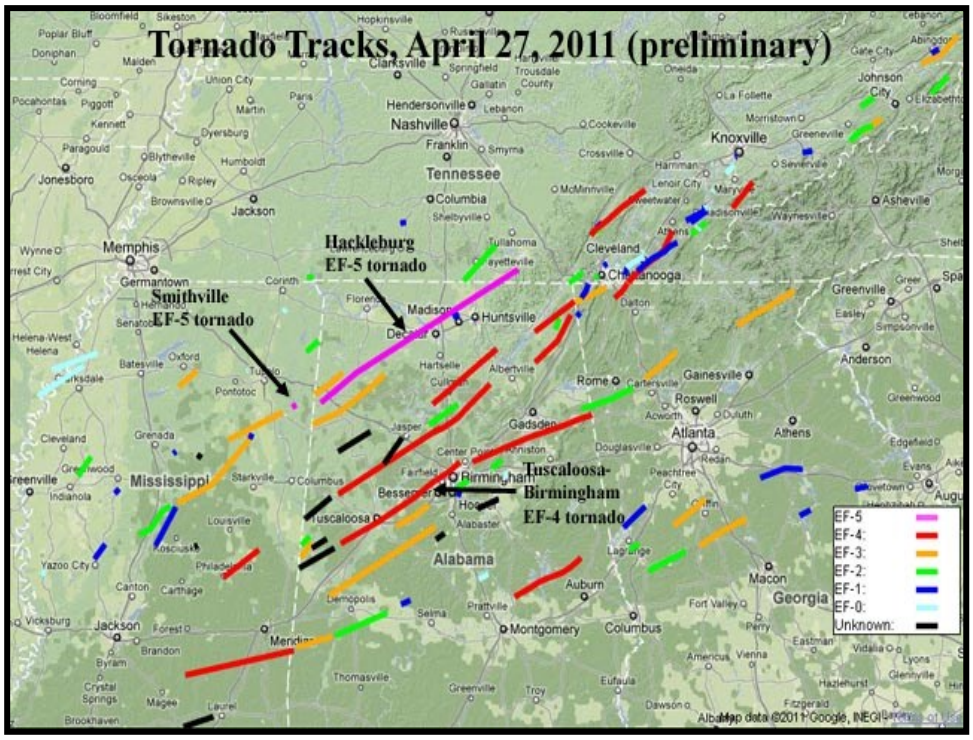
4 - Areas near rivers, lakes, and mountains are safe from tornadoes.

**False!** No terrain is safe from tornadoes and they can cross bodies of water. In the late 1980's, a tornado swept through Yellowstone National Park leaving a path of destruction up and down a 10,000 ft. mountain.

# 2011 Tornado Outbreaks
# What Can We Learn?

More than 200 tornadoes occurred in five days from April 25-28, 2011 over the Southeast part of the United States. On April 27th alone, 122 tornadoes ravaged parts of Mississippi, Alabama, Tennessee, Georgia, and Virginia resulting in 316 deaths, 2,400 injuries, and $4.2 billion in property damage.

The event was well anticipated with convective outlooks five days in advance and a high risk the morning of the event. All the tornado fatalities were within tornado watches and were preceded by tornado warnings. The lead time to the first significant tornado in each area ranged from 3 to 6 hours and the mean lead time for tornado warnings was 22.1 minutes. Despite the excellent performance of the Storm Prediction Center and the National Weather Service Forecast offices, 316 deaths resulted. This was the third deadliest tornado event since systematic tornado record-keeping began in 1950. The event follows the 1974 Super Tornado Outbreak (368 deaths) and the 1965 Palm Sunday Tornado Outbreak (337 deaths).




The service assessment covers the April 25-28, 2011 tornado outbreak, April 22, 2011 St. Louis, Missouri metropolitan event, and the North Carolina/South Carolina/Virginia tornado outbreak. It is suggested reading for all local, state, and federal Emergency Management partners.

Source: The Historic Tornadoes of April 2011 - **http://www.nws.noaa.gov/os/assessments/index.shtml**

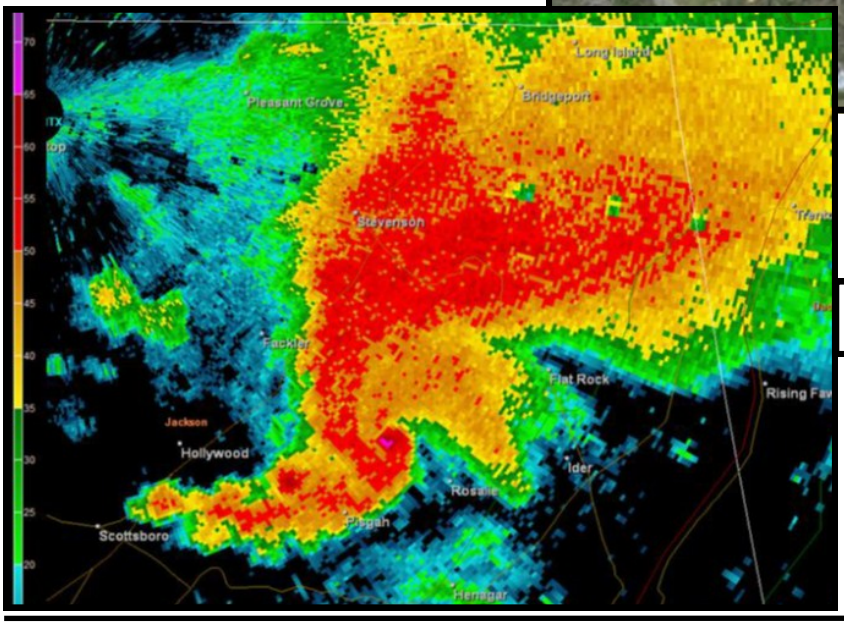
A service assessment was completed by the NWS and found the following to contribute to the high death toll:

- A large number of rare, long-track, violent tornadoes
- Tornado tracks intersecting densely populated areas
- Damage to warning dissemination sources
- Individuals in the affected areas who did not respond to warnings until confirmed by more than one communication source
- People in the paths of the storms who waited for visual confirmation before taking protective action
- The rapid pace of the storms, which moved at 45-70 mph, giving people who waited for secondary confirmation a smaller window of time in which to take shelter
- Residences that did not have adequate storm shelters

# 2011 Tornado Outbreaks
# What Can We Learn?

Tuscaloosa, AL EF-4 tornado damage photo.


Aerial photo of the Tuscaloosa, AL EF-4 tornado damage.




Radar image of the EF-4 tornado that moved through Tuscaloosa, AL.

# Central Plains Severe Weather Symposium and Family Weatherfest

## University of Nebraska - Lincoln's 12th Annual Family Weatherfest and Central Plains Severe Weather Symposium

**Saturday, March 31, 2012**
**9 a.m.- 4 p.m.**
**3310 Holdrege St.**
**Lincoln, Nebraska**
**Hosted by**
**UNL's School of Natural Resources**

**Severe Weather Symposium Theme:** ***"The Extreme Weather of 2011, Are We Prepared for 2012?"***
**Weatherfest Theme:** ***"Weather & Climate All Around Us"***

The Central Plains Severe Weather Symposium (CPSWS) began in Lincoln in 2000, and is a free public event open to the public with information for all ages. CPSWS events are organized by the High Plains Regional Climate Center, UNL's School of Natural Resources and the Lancaster County Office of Emergency Management as a combined effort to increase severe weather awareness. It is the commitment of CPSWS to create an outlet that puts severe weather information into as many homes and businesses in the region as possible.

The CPSWS has been able to bring together broadcast meteorologists from all major local network broadcast stations on an annual basis. CPSWS encourages the media's responsibility to the public in disseminating severe weather information. The CPSWS is closely tied to the efforts associated with Nebraska Emergency Management's Severe Weather Awareness Week.

The underlying theme for all CPSWS events is: "Surviving the Storms". Exhibitors and Severe Weather Experts are brought in each event to touch upon this theme and its varying aspects. One unique aspect of the CPSWS has been its ability to bring together different organizations and agencies under one roof to promote its underlying theme.

In an effort to keep the event a free event, the CPSWS has been sponsored by several businesses and organizations since the beginning. CPSWS has always been, and will always remain, a free public event in order to reach as many people as possible.

**For more information, please visit:**

**http://www.cpsws.unl.edu/**

WEATHERFEST

CPSWS
Central Plains Severe Weather Symposium